

REMARKS

The Office Action dated December 12, 2007 has been received and carefully noted. The above amendments to the claims, and the following remarks, are submitted as a full and complete response thereto.

Claims 1-3, 6-8, 11-14, 16, 18, and 20-44 have been amended to more particularly point out and distinctly claim the subject matter of the invention. New claims 45-48 have been added. No new matter has been added and no new issues are raised which require further consideration or search. Therefore, claims 1-48 are currently pending in the application and are respectfully submitted for consideration.

The Office Action rejected claims 1-5, 8-9, 11, 16-26 and 28-44 under 35 U.S.C. § 102(e) as being anticipated by U.S. Publication No. 2003/0128705 ("Yi"). The rejection is respectfully traversed for at least the following reasons.

Claim 1, upon which claims 2-3 and 6-7 are dependent, recites a method, which includes associating each data unit of a logical channel with a logical channel-specific sequence number without a priority identification number in a medium access control entity of a transmitter.

Claim 11 recites a method, which includes receiving, in a network infrastructure, data units of at least one logical channel, each data unit sent within one transmission time interval being associated with one logical channel-specific sequence numbers without a

priority identification number in a user terminal, and arranging the data units of each logical channel in a network element of the network infrastructure.

Claim 16, upon which claims 17-18 and 20 are dependent, recites a computer program product of a radio system, the computer program product being embodied on a computer readable medium and including program code for controlling a processor to execute a method. The method includes associating each data unit of a logical channel with a logical channel-specific sequence number without a priority identification number in a medium access control entity of a transmitter.

Claim 24 recites a computer program product of a radio system, the computer program product being embodied on a computer readable medium and comprising program code for controlling a processor to execute a method. The method includes arranging data units of each logical channel, in a network element of a network infrastructure, in order of the sequence numbers, each data unit of a logical channel being associated with a logical channel-specific sequence number without a priority identification number in a medium access control entity of a transmitter.

Claim 25 recites a network element, which includes a receiver configured to receive data units of at least one logical channel from a user terminal, each data unit of a logical channel sent being associated with a logical channel-specific sequence number without a priority identification number in a medium access control entity of a user terminal, and an arranger configured to arrange the data units of each logical channel in

order according to the sequence numbers associated with the data units. The network element is a part of a network structure.

Claim 28 recites a user terminal, which includes an associating unit configured to associate each data unit of a logical channel with a logical channel-specific sequence number without a priority identification number in a medium access control entity.

Claim 31 recites a system, which includes a transmitter and a medium access control entity in the transmitter. The medium access control entity is configured to associate each data unit of a logical channel with a logical channel-specific sequence number without a priority identification number.

Claim 32, upon which claim 33 is dependent, recites a system, which includes a network infrastructure, and at least one user terminal communicating with a network infrastructure over an air interface. A user terminal is configured to associate each data unit of a logical channel to be sent within one transmission time interval with one logical channel-specific sequence numbers without a priority identification number. The network infrastructure is configured to receive the data units of at least one logical channel associated with sequence numbers. The network infrastructure is configured to arrange the data units of each logical channel in order of the sequence numbers.

Claim 34, upon which claim 45 is dependent, recites an apparatus, which includes an associating entity configured to associate each data unit of a logical channel with a logical channel-specific sequence number without a priority identification number.

Claim 35, upon which claim 46 is dependent, recites an apparatus, which includes an associating entity configured to associate each data unit of a logical channel to be sent within one transmission time interval with one logical channel-specific sequence number without a priority identification number.

Claim 36, upon which claims 4-5, 8-10, 12-15, and 37 are dependent, recites a method, which includes associating each data unit of a logical channel to be sent within one transmission time interval with one logical channel-specific sequence number without a priority identification number in a transmitter.

Claim 38, upon which claims 19 and 21-23 recites a computer program product of a radio system, the computer program product being embodied on a computer readable medium and including program code for controlling a processor to execute a method. The method includes associating each data unit of a logical channel to be sent within one transmission time interval with one logical channel-specific sequence number without a priority identification number in a transmitter.

Claim 39 recites a system, which includes a transmitter configured to associate each data unit of a logical channel to be sent within one transmission time interval with one logical channel-specific sequence number without a priority identification number.

Claim 40, upon which claims 29-30 are dependent, recites a user terminal, which includes a network infrastructure, and an associating unit configured to associate each data unit of a logical channel to be sent within one transmission time interval with one logical channel-specific sequence number without a priority identification number.

Claim 41, upon which claim 47 is dependent, recites an apparatus, which includes a receiver configured to receive data units of at least one logical channel from a transmitter, each data unit of a logical channel sent within one transmission time interval being associated with one logical channel-specific sequence number without a priority identification number in the transmitter, and an arranger configured to arrange the data units of each logical channel in order according to the sequence numbers associated with the data units.

Claim 42, upon which claim 26 is dependent, recites a network element, which includes a receiver configured to receive data units of at least one logical channel from a transmitter, each data unit of a logical channel sent within one transmission time interval being associated with one logical channel-specific sequence number in the transmitter, and an arranger configured to arrange the data units of each logical channel in order according to the sequence numbers associated with the data units. The network element is part of a network infrastructure.

Claim 43, upon which claim 48 is dependent, recites an apparatus, which includes a receiver configured to receive data units of at least one logical channel from a transmitter, each data unit of a logical channel being associated with a logical channel-specific sequence number without a priority identification number in the transmitter, and an arranger configured to arrange the data units of each logical channel in order according to the sequence numbers associated with the data units.

Claim 44 recites a computer program product of a radio system, the computer program product being embodied on a computer readable medium and including program code for controlling a processor to execute a method. The method includes arranging data units of each logical channel, in a network element of a network infrastructure, in order of the sequence numbers, each data unit of a logical channel sent within one transmission time interval being associated with a logical channel-specific sequence number without a priority identification number in a transmitter.

Thus, according to embodiments of the invention, headers and signaling can be reduced since priority information is not needed and the PDUs in the same transmission interval do not need unique sequence numbers.

As will be discussed below, Yi fails to disclose or suggest all of the elements of the claims, and therefore fails to provide the advantages and features discussed above.

Yi generally discloses a method for preventing a stall condition in a terminal of a mobile communication system which uses a timer to limit how long data blocks are stored in a reordering buffer. The method includes receiving a data block over a wireless link, and determining whether a preceding data block has not been received. The method further includes storing the received data block in the reordering buffer if a preceding data block has not been received, and then outputting the received block from the buffer when the timer expires. Yi further discloses that whether or not a preceding data block is missing is determined based on a comparison of transmission sequence numbers. In other steps of the method, succeeding data blocks are output from the buffer based on

expiration of a second timer period. The periods of the timer are advantageously controlled to prevent a wraparound of transmission sequence numbers with respect to data blocks stored in the buffer. The data blocks can include MAC-hs protocol data units. By limiting the amount of time any one data block stays in the buffer, a stall condition is prevented. (see Yi at Abstract).

Applicants respectfully submit that Yi fail to disclose, teach, or suggest, all of the elements of the present claims. For example, Yi fails to disclose, teach, or suggest, at least, “associating each data unit of a logical channel with a logical channel-specific sequence number without a priority identification number in a medium access control entity of a transmitter,” as recited in claim 1, and similarly recited in claims 11, 16, 24-25, 28, 31-32, 34-36, and 38-44.

As described above, Yi discloses a method for preventing a stall condition in a terminal of a mobile communication system which uses a timer to limit how long data blocks are stored in a reordering buffer. Specifically, Yi discloses a radio interface protocol structure for a high-speed downlink packet access (HSDPA) system. (see Yi at paragraph 0030). Protocol layers can be divided into a first layer, a second layer, and a third layer based on three lower layers of an open system interconnection standard model. The first layer operates as a physical layer for a radio interface and is connected to an upper medium access control (MAC) layer through one or more transport channels. The second layer operates as a data link layer and lets various terminals share the radio resources of a wideband code division motile access (W-CDMA) network. The second

layer is divided into the MAC layer, a radio link control (RLC) layer, a packet data convergence protocol (PDCP) layer, and a broadcast/multicast (BMC) layer. The third layer contains a radio resource control layer. (see Yi at paragraph 0012, 0013, 0019).

Yi further discloses that the MAC layer is divided into a MAC-d sub-layer, a MAC-c/sh sub-layer, and a MAC-hs sub-layer. The MAC-d sub-layer manages dedicated transport channels for a specific terminal and the common transport channels. The MAC-hs sub-layer in the Node B manages a special transport channel identified as a High Speed-Downlink Shared Channel (“HS-DSCH”). (see Yi at paragraph 0032). Yi discloses that data is received from the RLC layer, processed, and then delivered to the HS-DSCH in the MAC layer. During this process, after a data block is formed by one or more MAC-hs SDUs, Yi discloses that a priority class identifier and a transmission sequence number are added to each data block before each data block is delivered to a hybrid automatic repeat request (HARQ) block. (see Yi at paragraph 0036). Thus, Yi discloses that a priority class identifier is used in associated each data block with a transmission sequence number.

In Figure 4 of Yi, it is disclosed that RLC PDUs arrive at the MAC-d layer through a dedicated traffic channel (DTCH), or a dedicated control channel (DCCH) which are logical channels. The PDUs of DTCH are fed forward to MACH-c/ch layer 1622. But before feeding forward, the PDUs are multiplexed in the MAC-d layer 161. (see Yi at paragraph 0033; Figure 4). The multiplexing may mix different data units from different logical channels in certain cases.

An example involves the priority class identifiers discussed in Yi. As discussed above, Yi discloses that a priority class identifier and a transmission sequence number are added to each data block. In Yi, each logical channel has priority but Yi is totally silent with respect to when each logical channel has a different priority class identifier. Thus, several logical channels may have the same priority class identifier. This is a clear indication that the priority class identifier is not used in Yi in the same manner as the logical channel-specific number is used in embodiments of the present invention.

Thus, in Yi, the data units are ordered in queues on the basis of the priority class identifiers in the transmission buffer. However, in embodiments of the present invention, the data units can be used to form queues on the basis of the logical channel-specific numbers, not the priority class identifier. Furthermore, if these queues are formed of the same data units, the queues are generally different.

Therefore, for at least the reasons discussed above, Yi fails to disclose, teach, or suggest, all of the elements of claims 1, 11, 16, 24-25, 28, 31-32, 34-36, and 38-44. For the reasons stated above, Applicants respectfully request that this rejection be withdrawn.

Claims 2-3 depend upon claim 1. Claims 4-5 and 8-9 depend upon claim 36. Claims 17-18 and 20 depend upon claim 16. Claims 19, and 21-23 depend upon claim 38. Claim 26 depends upon claim 42. Claims 29-30 depend upon claim 40. Claim 33 depends upon claim 32. Claim 37 depends upon claim 36. Claim 45 depends upon claim 34. Claim 46 depends upon claim 35. Claim 47 depends upon claim 41. Claim 48 depends upon claim 43. Thus, Applicants respectfully submit that claims 2-3, 4-5, 8-9,

17-23, 26, 29-30, and 33 should be allowed for at least their dependence upon claims 1, 16, 32, 34-36, 38, and 40-43, respectively, and for the specific elements recited therein.

The Office Action also rejected claims 6-7, 10, 12-15, and 27 under 35 U.S.C. § 103(a) as being unpatentable over Yi, in view of U.S. Publication No. 2004/0228313 (“Cheng”). The Office Action took the position that Yi discloses all the elements of the claims with the exception of certain elements of the claims. The Office Action then cited Cheng as allegedly curing the deficiencies of Yi. The rejection is respectfully traversed for at least the following reasons.

Claim 27 recites a radio network controller, which includes a receiver configured to receive data units of at least one logical channel from a user terminal, each data unit of a logical channel sent within on transmission time interval being associated with a logical channel-specific sequence numbers without a priority identification number in a user terminal, and an arranger configured to arrange the data units of each logical channel in order according to the sequence numbers associated with the data units.

The description of Yi, as discussed above, is incorporated herein. Cheng discloses a method of mapping data for uplink transmission in a communication system. A transmission parameter may be extracted from a received signaling message, and a transmission mode for uplink transmission selected based on the extracted transmission parameter. The data may be mapped from logical channels in a MAC layer to transport channels in a physical layer for transmission on the uplink. The transmission on the

uplink may be performed from one of an autonomous transmission mode and a scheduled transmission mode. (see Cheng at Abstract).

With respect to claim 27, while each of the present claims have their own scope, Applicants respectfully submit that Yi fails to disclose, teach, or suggest, at least, “a receiver configured to receive data units of at least one logical channel from a user terminal, each data unit of a logical channel sent within on transmission time interval being associated with a logical channel-specific sequence numbers without a priority identification number in a user terminal,” as recited in claim 27, for similar reasons, as discussed above, as to why Yi fails to disclose, teach, or suggest, at least, “associating each data unit of a logical channel with a logical channel-specific sequence number without a priority identification number in a medium access control entity of a transmitter,” as recited in claim 1, and similarly recited in claims 11, 16, 24-25, 28, 31-32, 34-36, and 38-44. Furthermore, Applicants respectfully submit that Cheng fails to cure Yi’s deficiencies because Cheng also fails to disclose, teach, or suggest, at least, “a receiver configured to receive data units of at least one logical channel from a user terminal, each data unit of a logical channel sent within on transmission time interval being associated with a logical channel-specific sequence numbers without a priority identification number in a user terminal,” as recited in claim 27.

With respect to the remaining claims, claims 6-7 depend upon claim 1, and claims 10 and 12-15 depend upon claim 36. As discussed above, Yi does not disclose, teach, or suggest all of the elements of claims 1 and 36. Furthermore, Cheng does not cure the

deficiencies in Yi, as Cheng also does not disclose, teach, or suggest, at least, “associating each data unit of a logical channel with a logical channel-specific sequence number without a priority identification number in a medium access control entity of a transmitter,” as recited in claim 1, and similarly recited in claim 36. Thus, the combination of Yi and Cheng does not disclose, teach, or suggest all of the elements of claims 6-7, 10, 12-15, and 27. Additionally, claims 6-7, 10, and 12-15 should be allowed for at least their dependence upon claims 1 and 36, respectively, and for the specific elements recited therein.

For at least the reasons discussed above, Applicants respectfully submit that the cited prior art references fails to disclose or suggest all of the elements of the claimed invention. These distinctions are more than sufficient to render the claimed invention unanticipated and unobvious. It is therefore respectfully requested that all of claims 1-48 be allowed, and this application passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicant’s undersigned representative at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicant respectfully petitions for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,



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Enclosures: Additional Claim Fee Transmittal
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